KUZOVKOV, A.D.;   MASSAGETOV, P.S.

Study of aconite alkaloids. Part 6. Monoacetylsongoring, new
alkaloid from Aconitum soongoricum. Zhur.ob.khim. 26 no.1:281-282
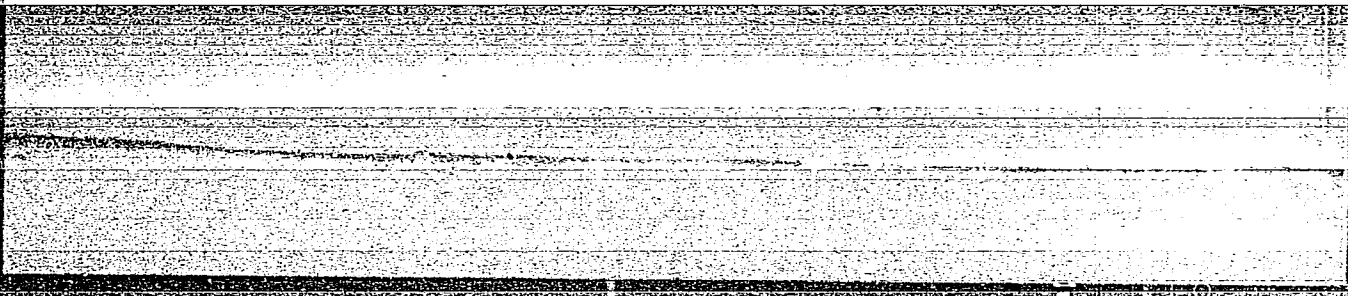Ja '56.   (MLRA 9:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevtiche-
skiy institut imeni S. Ordzhonikidze.
                      (Alkaloids) (Aconite)

Alkaloids of plants of the Elaeagnaceae family. Isolation of tetrahydroharmol and N-methyltetrahydroharmol from the bark of Elaeagnus angustifolia. T. F. Platonova, A. D. Kuzovkov, and P. S. Massagetov (S. Ordzhonikidze All-Union Chem. Pharm. Research Inst., Moscow). Zhur. Obshchei Khim. 26, 3220-3(1956); cf. C.A. 49, 0754f; Men'shikov, et al., C.A. 45, 2400f.—Extg. 83 kg. of the bark with iso-PrOH contg. 3% AcOH, dilg. with H2O, and

... ... intrared spectra of the alkа-
G. M. Kosolapoff

MASSAGETOY PS

MASSAGETOV, P.S.

PUKHAL'SKAYA, Ye.Ch.; PETROVA, M.F.; MASSAGETOV, P.S.

Testing plant extracts for their cytotoxic and concerocidal properties.
[with summary in English]. Biul.eksp.biol. i med. 43 no.6:57-60
Je '57.   (MIRA 10:10)

1. Iz laboratorii eksperimental'noy khimioterapii (zav. - chlen-kor-
respondent AMN SSSR L.F.Larionov), laboratoriya khimii prirodnykh
veshchestv (zav. - prof. G.P.Men'shikov) Instituta eksperimental'noy
patologii i terapii raka (dir. - chlen-korrespondent AMN SSSR N.N.
Blokhin) i iz botanicheskoy laboratorii (zav. - P.S.Massagetov) Vse-
soyuznogo nauchno-issledovatel'skogo khimiko-farmatsevticheskogo
instituta. Predstavlena deystvitel'nym chlenom AMN SSSR prof. A.D.
Timofeyevskim.
          (CYTOTOXIC DRUGS,
               plant extracts (Rus))

MASSAGETOV, P S

79-1-56/63

AUTHORS: Platonova, T. F. , Kuzovkov, A. D. , Massagetov, P. S.

TITLE: Investigation of Aconite Alkaloids (Issledovaniye akonitovykh
            alkaloidov) IX. On the Alkaloids of Aconitum excelsum
            (IX. Ob alkaloidakh Aconitum excelsum)

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol.28, Nr 1, pp.258-261 (USSR)

ABSTRACT: The alkaloids of the plant Aconitum excelsum Rehb. were in-
            vestigated by S. Y. Yunusov in whose report a short indication
            to the isolation of mesaconitine and two bases. These bases
            were characterized by the melting points ($265 - 267^\circ$ and about
            100° C). The authors investigated the roots of the plant. The
            material was collected in Tyan'Shane in fall after the dying
            of their upper parts. The present sample contained about 3 %
            alkaloid mixture whose chromatographic investigation on pa-
            per only indicated three products (R_b 0,66 , 0,49 and 0,38).
            By splitting up the mixture it was possible to liberate lap-
            paconitine (Rf 0,66) and two new alkaloids (R_b 0,74 and 0,76)
            which it was not possible to determine chromatographically and
Card 1/2   for whom the names aksin and aksinatin were suggested. The

79-1-56/63

Investigation of Aconite Alkaloids. IX. On the Alkaloids of Aconitum ex-
celsum
dry roots contain 0,016 % aksin and 0,002 % aksinatin. In this
manner the investigated material contained at least five ba-
ses. The products R_b 0,49 and 0,38 could not be separated as
such. Aksin, $C_{21}H_{29}O_5N$, contains two alcohol groups and one
acetoxy group and apparently also a single ether bond. Ak-
sinatin, $C_{21}H_{27}O_4N$, has an alcohol and a keto group and,
like aksin, also an acetoxy group. By saponification of the
latter amino alcohols were obtained from both, accordingly -
aksinidine, $C_{19}H_{27}O_4N$, and aksinatidine, $C_{19}H_{25}O_3N$. The
superterrestrial parts of the plant which were collected
in the pre-flowering-time contained 0,5 % of the noncrystal-
line alkaloid sum; by paper chromatography of the sum three
products were determined (R_b 0,64, 0,49, 0,38), from which
only lappaconitine (0,06 %) could be liberated. There are 2
references, all of which are Slavic.

ASSOCIATION: All-Union Scientific Chemical-Pharmaceutical Institute imeni S.
               Ordzhonikidze (Vsesoyuznyy nauchno-issledovatel'skiy khimiko-
               -farmatsevticheskiy institut imeni S. Ordzhonikidze)
SUBMITTED: January 8, 1957
AVAILABLE: Library of Congress
Card 2/2   1. Chemistry 2. Flora-Chemical analysis

SOV/79-28-11-50/55

AUTHORS: Platonova, T. F., Kuzovkov, A. D., Massagetov, P. S.

TITLE: Investigation of the Aconite Alkaloids (Issledovaniye akoni-
             tovykh alkaloidov) XIII. Alkaloid Aconitum Rotundifolium Kar.
             et Kir. and Aconitum Nemorum M. Pop. (XIII. Alkaloidy Aconitum
             rotundifolium Kar. et Kir. i Aconitum nemorum M. Pop.)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol 28, Nr 11, pp 3126-3128
             (USSR)

ABSTRACT: The orbicular-leaf aconite (Aconitum rotundifolium Kar. et
             Kir.) is a small perennial plant with two tubers and pale-
             lilac flowers. The underground parts of it were collected
             during blossom in August and September in the central part of
             Tyan'-Shan for the purpose of separating the alkaloids. The
             dried plant consisted of about 0.15 % alkaloids. In the mix-
             ture four bases were found by paper chromatography. In the
             aluminum oxide chromatography alkaloids of the empiric formu-
             lae $C_{27}H_{31}O_6N$ and $C_{26}H_{34}O_2N_2$ were separated from the mixture.
             The forest aconite (Aconitum nemorum M. Pop.) is a perennial

Card 1/2   grass-type plant with blue flowers and a little chain of

Investigation of the Aconite Alkaloids. XIII. Alkaloid Aconitum Rotundi-folium Kar. et Kir. and Aconitum Nemorum M. Pop.

SOV/79-28-11-50/55

tubers grown together. For the investigation the whole plants were collected in August during the blossom in the Tyan'-Shan, in the area of Lake Son-Kul'. The dried plant contained 0.2 % alkaloids. Two bases found in the mixture by paper chromato-graphy they turned out to be talat isamine (Ref 2) and mono-acetyl talat isamine. The latter was also obtained by the acetylation of the former (Ref 3); it had never before been found in plants. There are 3 Soviet references.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevti-cheskiy institut imeni S. Ordzhonikidze (All-Union Scienti-fic Chemo-Pharmaceutical Research Institute imeni S. Ordzhonikidze)

SUBMITTED: October 15, 1957

Card 2/2

SOV/79-28-11-51/55

AUTHORS: Platonova, T. F., Kuzovkov, A. D., Massagetov, P. S.

TITLE: Alkaloids of Plants of the Family Chenopodiaceae (Goosefoot) (Alkaloidy rasteniy semeystva Chenopodiaceae (marevyye)) Anabasis Jaxartica and Arthrophytum Leptocladum (Anabasis jaxartica i Arthrophytum leptocladum)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol 28, Nr 11, pp 3128-3131 (USSR)

ABSTRACT: Anabasis jaxartica (Bge.) Benth. is a 2o-3o cm high, perennial plant, which grows in the salt plains of the Syr-Dar'ya river. The dry plant contains 0.16 % alkaloids. In alkaloid mixtures four bases were produced by paper chromatography (R_f 0.30, 0.41, 0.17). In the separation, depending on the basicity, it was possible to separate 2 bases, Nr 1 (R_f 0.33) and Nr 2 (R_f 0.41). The substances with the denominations R_f 0.30 and 0.17 on the chromatogram yield weak stains and obviously are contained in the plant in only small quantities. Base Nr 1 corresponds to the formula $C_9H_{13}ON$; it is water soluble and is dyed with iron chloride. In the infrared spectrum the fol-

Card 1/3

Alkaloids of Plants of the Family Chenopodiaceae (Goosefoot). Anabasis
Jaxartica and Arthrophytum Leptocladum

lowing absorption bands can be seen: 3.0μ (a weak band,
(NH)), 3.8μ (a double band, hybrid ion), 6.2μ (a double
band, conjugated bonds). Their nitrogen is of secondary type.
The composition and the properties of base Nr 1 as well as
the constants of its salts correspond rather exactly to those
of N-methyl-4-oxy-β-phenyl-ethyl amine (Table 1) which never
before had been found on plants, although its methyl derivative
(hordenine - Ref 2) has been long known. The base Nr 2
$C_{10}H_{15}ON$ differs from base Nr 1 by the group CH_2. Its spectrum
differs very little from that of base Nr 1. The authors called
this new base Jaxartinin. From Arthrophytum leptocladum M. Pop.
N. K. Yurashevskiy (Ref 3) obtained dipterine, leptocladine,
and N-methyl-β-phenyl-ethyl amine. It contained 3.7% bases.
The authors succeeded in additionally separating the base
$C_{12}H_{14}N_2$ which has an NCH_3 group. One of the nitrogen atoms
is of basic character. This base with an excess hydrochloric
acid forms a chlorine monohydrate. Its infrared spectrum
points to an associated NH-group. The ultraviolet spectrum is

Card 2/3

SOV/79-28-11-51,55

Alkaloids of Plants of the Family Chenopodiaceae (Goosefoot). Anabasis
Jaxartica and Arthrophytum Leptocladum

identical with that of indole. Based on the above said as
well as on the similarity of the constants of the obtained
base and its salts with those of 3-methyl-1,2,3,4-tetrahydro-
β-carbinol (Ref 4, Table 2) they can be regarded as identical.
This carbinol had never before been found in plants. There
are 2 tables and 5 references, 2 of which are Soviet.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevti-
cheskiy institut imeni S. Ordzhonikidze
(All-Union Scientific Chemo-Pharmaceutical Research Institute
imeni S. Ordzhonikidze)

SUBMITTED: October 15, 1957

Card 3/3

AUTHORS: Platonova, T. F.,   Kuzovkov, A. D.,   Massagetov, P. S.

SOV/79-28-11-52/55

TITLE: On the Alkaloids of the Plants of the Family Asclepiadaceae
             (Milkweed) (Ob alkaloidakh rasteniy sem. Asclepiadaceae
             (lastovnevykh)) I. Antitoxicum Funebre (Boiss. et Ky.) Pobed.
             (I. Antitoxicum funebre (Boiss. et. Ky.) Pobed.)

PERIODICAL: Zhurnal obshchey khimii, 1958, Vol 28, Nr 11, pp 3131-313?
             (USSR)

ABSTRACT: The content of alkaloids of the plant family Asclepiadaceae
             is low. The authors report on the separation of two alkaloids
             (Ref 1), the tylophorine $C_{24}H_{27}O_4N$ and the tylophorinine
             $C_{23}H_{27}O_4N$ from the plant Tilophora asthmatica Wigt a. Arn.,
             as well as of the nicotine from the Asclepias syriaca (Ref 2).
             Of the 40 types of this plant family growing in the USSR
             only 2, the Cynanchum acutum and the L. Vincetoxicum sibiri-
             cum have been investigated until now; no alkaloids were found
             in them (Ref 4). The great interest for alkaloids of the
             plant family Apocynaceae and the botanical similarity with
Card 1/3   that of the Asclepiadaceae caused the authors to investigate

SOV/79-28-11-52/55

On the Alkaloids of the Plants of the Family Asclepiadaceae (Milkweed).
I. Antitoxicum Funebre (Boiss. et Ky.) Pobed.

the alkaloids of the latter. Antitoxicum funebre (Boiss. et Ky.) is a plant of a height of 40-70 cm. It grows on rocky slopes and unfertile places. The plants collected in the Caucasus in dried state contained 0.26 % alkaloids. In the paper chromatography the bases R_f 0.45 and 0.33 were found among others, in the aluminum oxide chromatography the base $C_{23}H_{25}O_3N$ (R_f 0.45), which has three OCH_3 groups. In the infrared spectrum the bands of the lactam carboniles and of the groups OH and NH are not present. The alkaloid hitherto not described was given the name antofine. Besides, two bases were separated in very small yields with only their melting points being determined. There are 5 references, 4 of which are Soviet.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevti-cheskiy institut imeni S. Ordzhonikidze (All-Union Scientific Chemo-Pharmaceutical Research Institute imeni S. Ordzhonikidze)

Card 2/3

5.3900   77416
                                                 SOV/79-30-1-77/78

AUTHORS: Yakovleva, A. P., Massagetov, P. S.

TITLE: Alkaloids of Sophora Griffithii

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 1, pp
              348-349 (USSR)

ABSTRACT: Two alkaloids were isolated from the leaves and young
              branches of Sophora griffithii: pachycarpine (from the
              ether fraction, 1.4% of the plant weight) and cytisine
              (chloroform fraction, 0.13%). Traces of two other
              bases were detected in the mother liquor by subjecting
              it to paper chromatography: matrine and sophoramine.
              There are 3 references, 1 Soviet, 2 German.

ASSOCIATION: S. Ordzhonikidze All-Union Scientific-Research Chemical-
              Pharmaceutical Institute (Vsesoyusnyy nauchno-issledovatel'
              skiy institute imeni S. Ordzonikidze)

SUBMITTED: December 23, 1958
Card 1/1

FILITIS, L.N.; MASSAGETOV, P.S.

Antineoplastic activity of aristolochic acid. Vop.onk. 7
no.8:97-98 '61.   (MIRA 15:1)

1. Iz laboratorii khimioterapii opukholey i khimiko-botanicheskoy
laboratorii Vsesoyuznogo nauchno-issledovatel'skogo khimiko-
farmatsevticheskogo instituta im. S. Ordzhonikidze.
          (CYTOTOXIC DRUGS)   (ARISTOLOCHIC ACID)

RYBALKO, K.S.; MASSAGETOV, P.S.

Sesquiterpene lactones of Artemisia leucodes Schrenk.
Med. prom. 15 no.11:25-26 N '61.   (MIRA 15:6)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut lekarstvennykh
i aromaticheskikh rasteniy.
        (ARTEMISIA)   (LACTONES)

MASSAGETOV, P.S.

In search of medicinal grasses. Zdorov'e 8 no.6:22-23 Je '62.

(MIRA 15:5)

(BOTANY, MEDICAL)

PLATONOVA, T.F.; MASSAGETOV, P.S.; KUZOVKOV, A.D.

Lallemantin a new alkaloid from the plant Lallemantia peltata
(L.) Fisch. et Mey. Med. prom. 16 no.2:14 F '62. (MIRA 15:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsev-
ticheskiy institut imeni S. Ordzhonikidze.
                    (LALLEMANTIA)
                    (ALKALOIDS)

RYBALKO, K.S.; MASSAGETOV, P.S.; YEVSTRATOVA, R.I.

Sesquiterpene lactones from some species of wormwood. Med.
prom. 17 no.6:41-43 Je'63   (MIRA 17:4)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut lekarstven-
nykh i aromaticheskikh rasteniy.

BOCHARNIKOVA, A.V.; MASSAGETOV, P.S.

Alkaloids of Leptorhabdos parviflora Benth. Zhur. ob. khim.
34 no. 3:102 -1028 Mr '64.   (MIRA 17:6)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatsevticheskiy
institut imeni S.Ordzhonikidze.

BRUTKO, L.I.; MASSAGETOV, P.S.

Study of some indigenous species of heliotrope. Rast. res. 1
no. 4:541-544 ' 65
(MIRA 19:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy khimiko-farmatesevti-
cheskiy institut imeni S. Ordzhonikidze, Moskva. Submitted
December 20, 1964.

MIKAHYLOV, V.N.; MASSALITINOVA, K.V.

Determining the reliability of series of water-level observations in river mouths; based on the example of the estuary region of the Danube. Trudy GOIN no.78:111-135 '64.

(MIRA 17:10)

MASSALSKA, M.

Fallout measurements in Kraków, L. Jurkiewicz and M. Massalska (Inst. Badań Jadrowych, Kraków, Poland). *Nukleonika* 3, Spec. No. 74-8(1958)(in English).—Results of fallout measurements from February 1957 to April 1958 are reported. The rain and dust samples were collected in flat vessels, contg. 1-9 ml. distd. H$_2$O in the case of dust-collecting vessels, a few drops concd. H$_2$SO$_4$ were added, and the sample evapd. Counters (β-ray) were calibrated against standard KCl samples. Dates of explosions were estd.　　　　　　　　　J. Stecki

MASSALSKA, M. ; KOWALSKI, T.

Atmospheric radioactivity.

p. 27. (KOSMOS. SERIA B: PRZYWODA NIEOZYWIONA.) (Warszawa, Poland) Vol. 4,
no. 1, 1958

SO: Monthly Index of East European Accession (EEAI) LC Vol. 7, No. 5, 1958

P/026/60/008/004/009/009
A189/A126

AUTHORS: Jurkiewicz, J., and Massalska, M.

TITLE: Institute of Nuclear Research, Polish Academy of Sciences -
             Results of measurements of the radioactivity of air contami-
             nants and atmospheric precipitation in Cracow for January to
             March 1960

PERIODICAL: Acta Geophysica Polonica, v. 8, no. 4, 1960, 379

TEXT: Table p. 379 (English text)

Atmospheric precipitation radioactivity — pC/liter				Total fallout radioactivity — mC/km³/day			
Date	I	II	III	Date	I	II	III
1	—	—	—	1	0.04	0.01	1.23
2	108.5	—	—	2	0.12	0.01	0.14
3	—	—	—	3	0.12	0.13	0.14
4	—	—	217.8	4	0.05	0.13	0.22
5	16.4	—	—	5	0.05	0.04	0.10

Card 1/3

MASSAL'SKAYA, K.P.

E.F.Chladni, founder of scientific meteoritics. Meteoritika no.11:
33-46 '54.
(Chladni, Ernest Florens Friedrich, 1756-1827)

(MIRA 8:3)

MASSAL'SKAYA, K.P.

Bibliography on meteorites. Meteoritika no.13:147-173 '55.
(Bibliography--Meteorites)   (MIRA 9:2)

MASSAL'SKAYA K.P.

MASSAL'SKAYA,K.P.

Pallas iron. Priroda 44 no.9:78-82 S'55. (MIRA 8:11)
(Meteorites)

MASSAL'SKAYA, K.P.

Bibliographical index of literature on meteoritics (no.4, 1953-
54). Meteoritika no.14:123-147 '56.   (MIRA 10:1)
                (Bibliography--Meteorites)

MIKHAILOVSKAYA, A. I.

PLACE I ROCK EXPLANATION

(4)

Unabridge nauk SSSR. Lustet po meteoritam

Meteoritkn; sbornik statey, vyp. 16 (Mineralogiya)
Moscow, 1958. 209 p. Errata slip inserted.
1,500 copies printed.

Ed.: V.G.Fesenkov, Academician; Deputy ed. L.G. Kulik,
ing House: L.K. Khabyonst; Edit. Kulik, L.G.

PURPOSE: This publication is intended for geologists,
physicists, and other specialists concerned with the...

COVERAGE: This collection contains 4 articles on...
meteorites, and 2) information and...
fereaco on Meteorites...
Sciences (USSR, held in...
deal with the origin...
Silbato-Allin', servico...
tion, structure, and the chemical...
serious the activities of the Committee on...
my, Institute of Physics, Belgarian Academy of Sciences...
are continued.

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Fesenkov, V.G. Academician. Contributions...
Orbits and on the Velocity of the Minor Planets...

Kvasha, L.G. Thermal Metamorphosis of Some Types of Stone Meteorites   147

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Meteorite

Dyakonova, M.I. Nickel Content in Samples of Iron Meteorites in the   175
Collection of the Academy of Sciences USSR

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AVAILABLE: Library of Congress   151

Card 6/6

JA/sov/gmg
7-15-60

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International organizations for research on meteorites. Meteoritika
no.15:180-182 '58.   (MIRA 11:4)
                  (Meteorites)

MASSAL'SKAYA, K.P.

Institutions for research on meteorites in the United States.
Meteoritika no.15:183-189 '58.   (MIRA 11:4)
                (United States--Meteorites)

MASSAL'SKAYA, K.P.

Bibliographical index of the literature on meteoritics.
Meteoritika no.16:181-205 '58.   (MIRA 11:8)
                    (Bibliography--Meteorites)

MASSAL'SKAYA, K.P.

Classification system for the literature on meteoritics.
Meteoritika no.17:143-158 '59.   (MIRA 13:6)
          (Classification--Books)

MASSAL'SKAYA, K.P.

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no.21:81-135 '61.   (MIRA 14:11)
                    (Bibliography—Meteorites)

MASSAL'SKAYA, K.P.

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1959-1960. Meteor tika no.23:101-135 '63.   (IMIA 16:)
                        (Bibliography—Meteorites)

MASSALSKI, Edmund; KRAJEWSKI, Stanislaw; GOETEL, Walery

Remembrances about Jan Czarnocki. Przegl geol 10 no.8:411-414 Ag '62.

2003 On Some Low Ionizing Radiation Observed by Measurements of Cosmic Radiation at Great Depths. M. Miesowicz, L. Jurkiewicz, and J. M. Massalski. Phys. Rev. 77, 310-311(1950) Feb. 1.

By measurements of twofold, threefold, and fourfold coincidences with a Geiger counter telescope, the underground rays at 680 and 840 m water equivalent have been divided into two components. One of the components is ionizing, discharging the counters with almost 100% efficiency, and has a strong maximum in the vertical direction. The other component discharges the counters with a very low efficiency, producing numerous twofold coincidences but practically no threefold or fourfold coincidences. It is isotropic in direction and rapidly absorbed in lead. This second component is thought to be composed of γ rays of local radioactive origin. The telescope used in these experiments differed from that of Barnóthy and Forró in that it was protected from side showers by anticoincidence counters. The ratio of twofold to threefold coincidences was found to be about 1.4 instead of 30 as reported by Barnóthy and Forró at 1000 m. water - equivalent (Phys. Rev. 55, 870(1939)). (auth)

MASSALSKI - J.M.

POL.

537,591,15

2842   The transition curve of the photon component of extensive air showers.   J. M. MASSALSKI.   Bull. Acad. Polon. Sci. Cl. 3, 2, No. 7, 335-40 (1954).

MASSALSKI, JERZY

Some problems in electronics related to particle detection in nuclear physics. Jerzy Massalski. *Postepy Fiz.* 6, 235–57 (1955).—Review of modern electronic equipment facilitating research in nuclear physics.   Sylvia Newluska
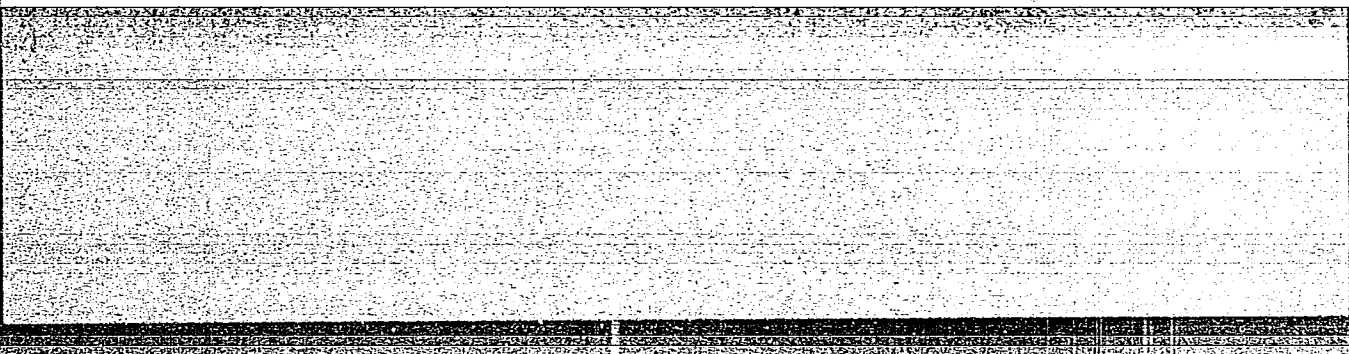
MASSALSKI, J.M.

Category : POLAND/Nuclear Physics - Instruments and Installations   Methods of   C-2
           Measurement and Investigation

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 294

Author   : Massalski, Jerzy
Title   : Latest Progress in the Field of Counting Systems and Systems for
           Coincidence Counting

Orig Pub : Postepy fiz., 1956, 7, No 2, 153-181

Abstract : No abstract

Card   : 1/1

MASSALSKI, J. M.

JANOSSY, L.

21(1)   PHASE I BOOK EXPLOITATION   HUN/1911

International Conference on Cosmic Radiation. Budapest. 1956.

International Conference on Cosmic Radiation Organized by the Hungarian Academy of Sciences. Budapest, 1957. 187 p. 800 copies printed.

Sponsoring Agency: Magyar Tudomanyos Akademia

Eds.: E. Fenyves, and A. Somogyi

PURPOSE: This report is intended for geophysicists concerned with cosmic radiation.

COVERAGE: This report contains/the six plenary sessions of the conference. Some of the problems dealt with include nuclear emulsions, extensive air showers and the program of cosmic ray measurements planned for the International Geophysical Year. Most of the reports are followed by references. Soviet scientists in the field of cosmic radiation who attended the conference are: E.L. Andronikashvili, N.A. Dobrotin, I.I. Gurevich, S.I. Nikolskiy and S.N. Vernov. The articles are written in English, German and Russian without parallel translations.

International Conference (Cont.)   HUN/1911

3. Nikol'skiy, S.I. The Study of Nuclear Active Components of Extensive Atmospheric Showers of Cosmic Rays   50

4. Vernov, S.N. and Zatsepin, G.T. Height Dependence and the (not incl.) Problem of the Core of Extensive Atmospheric Showers
   Chudakov, A.Ye. Cherenkov Radiation of Extensive Atmospheric Showers of Cosmic Rays   57

5. Andronikashvili, E.L., and N.P. Bibilashvili. The Study of   63

6. the Spatial Dispersion of Penetrating Particles of Extensive Atmospheric Showers

THIRD SESSION
EXTENSIVE AIR SHOWERS

1. Babecki, J.L. Jurdleries, and J.M. Massalski. The Transition Curve of ... Photon Component of Extensive Air Showers in Lead Absorbers of Thicknesses Between 0 and 25 cm.   73

2. Janossy, L., T. Sandor, and A. Somogyi. Investigation of Extensive Air Showers 230 m. Above Sea Level   86

Card 1/6

CZECHOSLOVAKIA/Nuclear Physics - Cosmic Rays   C-7

Abs Jour : Ref Zhur - Fizika, No 9, 1958, No 20027

Author   : Dubinsky J., Massalski J.M., Modry, P., Oles A., Porebski J.
Inst   : Not Given
Title   : Photon Component of Extensive Atmospheric Showers

Orig Pub : Mat.fyz. crsop., 1957, 7, No 4, 235-254

Abstract : Measurement of the transition curve was made with the aid of
           a setup consisting of the normal shower detector and two
           telescopes. The shower detector consists of three groups of
           counters connected in parallel. Each telescope consists also
           of three groups of counters in aprallol, and in one teles-
           cope the counters are made of brass, and in the other they
           are made of aluminum. The limiting energy of thetelescope
           with the brass counters is close to 15 Mev, and that for al-
           uminum counters is less than 5 Mov. Each telescope could
           register eight different types of coincidences. The thick-
           ness of the absorber and the aluminum telescope fluctuated
           from 0 to 50 mm Pb, and in the brass telescope it fluctuated
Card   : 1/3

22

CZECHOSLOVAKIA/Nucleer Physics - Cosmic Rays   C-7

Abs Jour : Ref Zhur - Fizika, No 9, 1958, No 20027

from 0 to 200 mm Fb. Measurements were made at an altitude
of 2636 meters above sea level, i.e., at a depth of 20.2
cascade units from the surface of the atmosphere. The trans-
ition curves obtained coincide with the curves obtained in
Krelkow at practically sea level. The ratio of the photons
and electrons on the transitioncurve is calculated by the
method proposed in the work by Milino (Milone, C., Physical
Review, 1952, 87, 680) and the work of Masselski (Bull. Acad.
Polon. sci. Cl. III, 1954, 2, 335). Of the six-fold coin-
cidences (three groups of telescopes and three groups of de-
tectors) the following data were obtained: for a brass teles-
cope f/o=1, for an aluminum telescope f/o=0.9. A large num-
ber of soft photons with energies less than two Mev were
found in the showers. The presence of these photons, like
the presence of penetrating photons generated in lead with
energies 2 to 7 Mev, can be detected from het influence on
the transition curve. In addition, the presence of a large
number of soft photons in large showers confirmst the absence

Card   : 2/3

CZECHOSLOVAKIA/Nuclear Physics - Cosmic Rays   C-7

Abs Jour : Ref Zhur - Fizika, No 9, 1958, No 20027

of coincidences in the upper or middle group of counters of
the telescope also in the absence of an absorber. By taking
into account the presence of low-energy photons in large
showers, the authors obtained a ratio f/e greater than 1,
which is in full agreement with the theory of electron-
photon cascades.

Card   : 3/3

MASSALSKI, J.M.

POLAND/Nuclear Physics - Cosmic Rays   C-7

Abs Jour : Ref Zhur - Fizika, No 7, 1958, No 15208

Author   : Babecki J., Jurkiewicz L., Massalski J.M., Miesowicz M.
Inst   : Institute of Nuclear Research, Polish Academy of Sciences,
            Academy of Mining and Metallurgy, Krakow, Poland
Title   : The Transition Curve of the Electron-Photon Component of Ex-
            tensive Air Showers in Lead Absorber of Thickness Between
            0 and 25 cm.

Orig Pub : Acta phys. polon., 1957, 16, No 1-2, 119-133

Abstract : Measurements were made of the absorption curve for particles
            of extensive atmospheric showers with the aid of the ordin-
            ary setup for the registration of extensive showers, consis-
            ting of three rows counters and a telescope, consisting of
            three rows of counters of large area. Simultaneously, there
            were recorded eight types of coincidences at two positions of
            the lead absorber with respect to the rows of the elescope
            counters. The thickness of the absorber was varied from 0 to
            25 cm. On the basis of the results obtained the authors have
Card   : 1/2

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POLAND/Nuclear Physics - Cosmic Rays   C-7

Abs Jour : Ref Zhur - Fizika, No 7, 1958, No 15208

> calculated the ratio p/e of the number of photons to the
> number of electrons in extensive atmospheric showers, found
> to be equal to 0.70 ⌐ 0.15. All the results of the measure-
> ments made by other authors, connected with the determin-
> ation of p/e, have been analyzed. It is shown, that among
> the particles leaving the lead absorber of thickness of sev-
> eral centimeters, there exists a large number of penetrating
> photons of low energy, and that these may be recorded by in-
> dividual rows of counters, but are not recorded by a tele-
> scope consisting of two or three rows of counters. The
> mechanism of registration corresponds to that proposed by
> Greisen.

Card   : 2/2

POLAND/Nuclear Physics - Penetration of Charged Neutral
    Particles Through Matter.   C

Abs Jour : Ref Zhur Fizika, No 2, 1960, 3090

Author : Massalski, J.M., Oles, A.

Inst : Institute of Nuclear Research, Polish Academy of Sciences,
    Krakow, Poland

Title : On the Ratio of Photons to Electrons in Extensive Air
    Showers of Cosmic Radiation Found from Analysis of the
    Transition Curve

Orig Pub : Acta phys. polon., 1958, 17, No 6, 401-403

Abstract : An analysis is made of the transition curve for particles
    of extensive atmospheric showers of cosmic radiation at
    an altitude of 2,636 meters above sea level. The exist-
    ing discrepancy between the experimental and theoretical
    values of the ratio of the number of photons to the

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POLAND/Nuclear Physics – Penetration of Charged Neutral
            Particles Through Matter.

Abs Jour   : Ref Zhur Fizika, No 2, 1960, 3090

C

number of electrons (p/e) is explained. In accordance
with the predictions of the theory, a large number of
photons have been observed with energy less than thres-
hold energy of the apparatus for the registeration of
electrons. The ratio of the number of photons to the
number of electrons is found for an electron threshold
energy of 50 Mev and a photon energy 15 -- 30 Mev,
amounting to p/e = 1.0 ± 0.1 (only the statistical error
is indicated), which is less than actual values because
of the influence of slow-energy photons on the transition
curve.

Card 2/2

PHASE I BOOK EXPLOITATION   POL/4309

Massalski, Jerzy M.

Detekcja promieniowania jadrowego (Detection of Nuclear Radiation) Warsaw,
    Panstwowe wyd-wo naukowe, 1959.   372 p. 2,700 copies printed.

No contributors mentioned.

PURPOSE: This book is intended for nuclear physicists interested in the design,
    construction, and operating principles of radiation counters.

COVERAGE: The book describes the design, construction and operation of ionization
    instruments and scintillation counters. The most common arrangements of
    electronic instruments are given. The effect of radiation on matter, the principal
    phenomena occurring in ionization instruments and the properties of such instru-
    ments are also described. Considerable attention is given to Geiger-Müller and
    scintillation counters. Two sections of the book are concerned with the calcu-
    lation of statistical errors and the loss of pulses in counters. Materials
    published through 1956 were used in the composition of the book. The author
    thanks Michalina Massalska, M.S., for assistance. There are no references.

Card 1/2

L1047

S/058/62/000/008/023/134
A061/A101

3,2410 (also 2805)

AUTHORS: Łoskiewicz, Jerzy, Massalski, Jerzy, Nizioł, Bronisław, Oleś, Andrzej

TITLE: Energy spectrum of the nuclear active component of cosmic radiation at 200 and 3,200 m above sea level

PERIODICAL: Referativnyy zhurnal, Fizika, no. 8, 1962, 57 - 58, abstract 8B413 (Rept. Inst. badań jądrow. PAN, 1961, no. 278/VI, 22 pp., illust., English; summaries in Polish and Russian)

TEXT: The energy spectrum of the nuclear active component of high-energy cosmic rays was measured on Mount Aragats (3,200 m above sea level) and in Moscow (200 m above sea level). The apparatus consisted of ionization chamber units placed between variously thick lead and graphite absorbers. The integrated energy spectra of the nuclear active particles recorded at the two altitudes have the form of $E^{-\gamma}$ in the $10^{12} \div 5 \cdot 10^{13}$ ev range, and at energies higher than $5 \cdot 10^{13}$ ev the spectral exponents have the tendency to increase. The exponents of power-law spectra read $\gamma = 1.58 \pm 0.09$ for the mountain altitude and $\gamma = 1.6 \pm 0.2$ for the sea level, while the exponent of the primary energy spectrum in the $10^{12} - 10^{15}$ ev range reads $\gamma \approx$

Card 1/2

Energy spectrum of the nuclear active component of...

S/058/62/000/008/023/134
A061/A101

1.6. Such a constancy of the spectral exponent indicates that the total inelasticity factor of nuclear collisions does not depend on the energy.

[Abstracter's note: Complete translation]

Card 2/2

MASSALSKI, J.

.5

P/046/62/007/002/001/003
D256/D302

9.6150 (1,3 4,2)

AUTHORS: Grigorov, N.L., Tretyakova, Ch.A., Shestoperov, V.J.,
             Babyan, Kh.P., Dayadzhyan, N.G., Buja, Z., Loskiewicz,
             J., Massalski, J., and Oleś, A.

TITLE: Integral spectrum of ionization pulses caused by
             nuclear active particles of cosmic radiation at
             mountain altitudes

PERIODICAL: Nukleonika, v. 7, no. 2, 1962, 61 - 73

TEXT: The investigation was conducted in order to obtain informa-
tion concerning: 1) The pulse spectrum and its dependence upon the
dimensions of the apparatus, 2) the altitude dependence of the fre-
quency of the registered pulses, 3) the mechanism of local genera-
tion of π^0 mesons by nuclear active particles. The apparatus cove-
red an area of 10 m^2 and it consisted of 6 horizontal trays of 33
ionization chambers each, the trays being separated by graphite and
lead absorbers, arranged to enable detection of electromagnetic
cascades created by the decay products of π^0 mesons and evaluation

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Integral spectrum of ionization ...   P/046/62/007/002/001/003
D256/D302

of the energy transferred in the interactions up to 2×10^{13} ev.
The pulses and pulse heights were recorded photographically from
screens of 6 cathode-ray oscilloscopes with waiting spot. Using me-
chanical selectors it was possible to register subsequently indivi-
dual pulses from all the ionization chambers, each of them being
connected to its own amplifier. The experiments were carried out at
two altitudes: 200 m (Moscow) and 3200 m above the sea level (the
Mountain Station of the Armenian Academy of Sciences at mount
Aragac). Owing to the independent registration in each ionization
chamber it was possible to divide the registered pulses into two
groups: 1) Single pulses, i.e. events in which the pulse in each
tray was registered by a small number of ionization chambers; 2)
Structural' pulses defined as events occuring at least in one of
the trays 1 to 4, in such a way that the groups of ionization cham-
bers showing pulses were interspaced with one or more chambers
without any ionization. The first group of pulses was attributed to
nuclear active particles as well as μ mesons, and the second one
could be produced only by groups of nuclear active particles fall-
ing simultaneously on the apparatus, as it was borne out from the

Card 2/4

Integral spectrum of ionization ...

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D256/D302

investigation of the influence of the dimensions of the apparatus used upon the ionization spectra. The dependence of the percentage of the structural pulses upon the registered pulse height was examined, showing that the percentage of the structural pulses is a monotonic function increasing with the increase of the total pulse height registered i.e. with increasing the total energy. In order to assess the role of μ mesons, the altitude dependence was investigated of generating pulses of different nature. The integral spectra were found to be exponential: $N = AI^{-\gamma}$ in the region of pulse heights from 10^3 to 10^5 particles. The following conclusions were derived from the analysis of the experimental results: 1) The spectra induced by nuclear active particles depend essentially on the dimensions of the apparatus and on the pulse heights. The exponent γ of the integral spectrum for pulse heights (measured in numbers of particles) ranging from 2×10^3 to 2×10^5 particles changes from $\gamma = 1.41$ to $\gamma = 2.00$ for the area of the apparatus changing from 330×330 cm^2 to 10×330 cm^2 respectively. 2) At mountain altitudes the exponent γ of the integral spectrum for single nuclear active particles was determined to be $\gamma = 2.01 \pm 0.08$ for $3 \times$

Card 3/4

Integral spectrum of ionization ...   P/046/62/007/002/001/003
D256/D302

$10^3 \leq I \times 3 \times 10^4$, and for all the nuclear active particles including the structural pulses $\gamma = 1.62 \pm 0.04$. 3) The integral spectrum of the large pulses by μ mesons is also of an exponential form with $\gamma = 2.22 \pm 0.14$. 4) At the sea level the contribution of the μ mesons constitutes approx. 70 % of all single pulses with a height $\geq 2 \times 10^3$ particles and 50 % for heights $\geq 2 \times 10^4$ particles. There are 5 figures, 4 tables and 4 Soviet-bloc references.

ASSOCIATION: Institute of Nuclear Physics, University of Moscow; (N.L. Grigorov, Ch.A. Tretyakova, and V.J. Shestoperov); Institute of Nuclear Physics, Armenian Academy of Sciences, Yerevan; (Kh.P. Babayan, and N.G. Bayadzhyan); Institute of Nuclear Research, Polish Academy of Sciences, Cracow; Academy of Mining and Metallurgy, Cracow, II Department of Physics (Z. Buja, J. Łoskiewicz, J. Massalski, and A. Oleś)

SUBMITTED: January, 1962

Card 4/4

GRIGOROV, N.L.; TRETYAKOVA, C.A.; SHESTOPIEROV, V.J.; BABAYAN, C.P.;
    BAYADSYAN, N.G.; BABECKI, J.; LOSKIEWICZ, J.; MASSALSKI, J.;
    OLES, A.

Investigations of energy particles interactions with atomic
nuclei at the mountain altitudes. Nukleonika 7 no.12:
759-767 '62.

1. Institute of Nuclear Physics, University of Moscow, Moscow
(for Grigorov, Tretyakova, Shestopierov). 2. Armenian Academy
of Sciences, Institute of Nuclear Physics, Erevan (for Babayan
and Bayadsyn). 3. Institute of Nuclear Research, Laboratory of
High Energy Physics, Krakow, Polish Academy of Sciences (for
Babecki, Loskiewicz, Massalski, Oles).

P/047/62/013/002/002/006
D218/D308

AUTHOR: Massalski, Jerzy

TITLE: The inelastic coefficient in very high energy nuclear
               collisions

PERIODICAL: Postępy fizyki, v. 13, no. 2, 1962, 137 - 153

TEXT: The inelastic coefficient of nucleon-nucleon or nucleon-nu-
cleus collisions is defined as the fraction of the total kinetic
energy in the CM system which is re-emitted after the collisions in
the form of newly created particles. The magnitude of this coeffi-
cient is of importance in nuclear theory, because it depends on the
spatial distribution of field energy near the center of the nucleon.
In the first part of the paper the authors summarize the various me-
thods which may be used to determine the above coefficient both di-
rectly and indirectly (density attenuation length, attenuation
length of the number of showers, ionization chambers, and so on).
All these methods have been described in published literature. A re-
view of the results reported by the Bristol and Moscow groups shows
that there is a discrepancy between them. Thus, according to the
Card 1/2

The inelastic coefficient in very ...

P/047/62/013/002/002/006
D218/D3o8

Moscow group (N.L. Grigorov et al, Moscow Conference on Cosmic Radiation, v. 1, 1960, 122) have found that for nucleons colliding with heavy nuclei the pion part of the above coefficient at energies below 10^{11} eV is 0.5, whereas above 10^{11} eV the magnitude of this quantity increases to 1.0. According to a reprint received by the author from the Bristol group the magnitude of K_π at nucleon energies of 10^{12} eV is only 0.1 and decreases with increasing energy. There are 3 tables and 4 figures.

ASSOCIATION: Instytut badań jądrowych, Zakład wysokich energii, Kraków (Institute of Nuclear Research, High Energy Enterprise, Kraków)

Card 2/2

LOSKIEWICZ, J.; MASSALSKI, J.; NIZIOL, B.: OLES, A.;

Analysis of the integral spectrum of ionization pulses
caused by nuclear active particles at mountain altitudes.
Acta physica Pol 23 no.1:77-92 Ja '63.

1. Institute of Nuclear Research, Laboratory of High
Energy Physics, Krakow, and II Department of Physics,
Academy of Mining and Metallurgy, Krakow.

GRIGOROV, N.L.; TRETYAKOVA, C.A.; SHESTOPEROV, V.J.; BABAYAN, C.P.;
    BOYADSYAN, N.A.; MASSALSKI, J.; NIZIOL.B.; OLES,A.

Integral spectrum of nuclear active particles at mountain
altitudes from the investigation of high ionization pulses.
Acta physica Pol 24 no.3:357-371   S'63.

1. Institute of Nuclear Physics, University, Moscow (for
Grigorov, Tretyakova, Shestoperov). 2. Institute of Nuclear
Physics, Armenian Academy of Sciences, Erevan (for Babayan,
Boyadsyan). 3. Institute of Nuclear Research, Laboratory
of High Energy Physics, Krakow, and II Department of Physics,
Academy of Mining and Metallurgy, Krakow (for Massalski,
Niziol and Oles).

BABECKI, J.; BUJA,Z.; MASSALSKI,J.; NIZIOL, B.

Energy spectrum of photons from decay of π^0-mesons generated in nuclear interactions at the altitude of 3200 m. above sea level. Acta physica Pol 24 no.3:373- 380 S'63.

1. Institute of Nuclear Research, Laboratory of High Energy Physics, Krakow Department.

POLAND

MASSALSKI, Jerzy Michal

Nuclear Engineering Institute, Academy of Mining and Metallurgy
(Instytut Techniki Jadrowej Akademii Gorniczo-Hutniczej), Crakow

Crakow, Postepy fizyki, No 3, May/June 1966, pages 233-238

"Professor Dr Leopold Jurkiewicz, Professor of Physics, Academy
of Mining and Metallurgy and Institute for Nuclear Research
(10 July 1906 - 30 March 1966)." Includes bibliography of
Jurkiewicz's published work.

POLAND

MASSALSKI, Jerzy Michal

Institute of Nuclear Engineering, Academy of Mining and Metallurgy
(Instytut Techniki Jadrowej Akademii Gorniczo-Hutniczej), Crakow

Warsaw, Acta geophysica polonica, No 3, July/Sept 1966, pp 255-58

"Prof. Dr. Leopold Jurkiewicz (1906-1966). Includes his bibliography."

MASSALSKI, Michal

①

V.
GINZBURG, W.L.
USSR
no title given
no affiliation given
Crakow, Postepy Fizyki, Vol XIII, No 5, 1962, pp 507-48.
"Cosmic Radiation approximating the Earth and in the Cosmos".

Translated by:
✓ Michal MASSALSKI, no title or affiliation given

RESZKE, Halina; MASSALSKI, Wandalin

Myocardial fragmentation. Polski tygod. lek. 9 no.33:1026-1031
16 Aug 54.

1. Z Pracowni Anat. Pat. Szpitala Miejskiego Nr 4: kierownik:
prof. dr med. Janina Dabrowska.
       (MYOCARDIUM,
           fragmentation)

MASSALSKI, Wandalin; DABROWSKI, Stanislaw

Case of Morgagni-Adams-Stokes syndrome treated with sodium lactate
injections. Polski tygod. lek. 12 no.5:181-183 28 Jan 57.

1. (Z II Zakladu Chorob Wewnetrznych IDSKI, kierownik: prof.
dr. med. Walenty Hartwig i z XIII Oddzialu Instytutu Gruzlicy,
dyrektor: prof. dr. med. Janina Misiewicz). Adres: Warszawa,
Plocka 26, Instytut Gruzlicy.
    (HEART BLOCK, ther.
        Adams-Stokes synd., sodium lactate inject. (Pol))
    (LACTATES, ther. use
        sodium lactate in Adams-Stokes synd., (Pol))

MASSALSKI, Wandalin; KULEJEWSKA, Magdalena

Effect of ACTH in experimental tetanus. Polski tygod. lek.
12 no.7:252-254 11 Feb 57.

1. (Z Instytutu Doskonalenia i Specjalizacji Kadr Lekarskich;
dyrektor: prof. dr. W. Hartwig i z Zakladu Mikrobiologii Instytutu
Gruzlicy; dyrektor: prof. dr. J. Misiewicz; kierownik Zakladu:
doc. dr. M. Buraczewska). Adres: Warszawa, ul. Plocka 26, Instytut
Gruzlicy.
        (TETANUS, exper.
              eff. of ACTH in mice (Pol))
        (ACTH, eff.
              on exper. tetanus in mice 'Pol))

MASSALSKI. W.

KOSINSKI, Wladyslaw; SZKLARSKA, Zofia; MASSALSKI, Wandalin; PIOTROWSKI, Andrzej

Congenital communication between the aorta and the pulmonary artery
diagnosed during life in a 32-year-old woman as patent ductus arteriosus.
Polski tygod. lek. 12 no.42:1617-1619 21 Oct 57.

1. Z I Oddz. Chorob Wewn. Szpitala Miejskiego nr 4 w Warszawie; Ordynator:
dr Wl. Kosinski, z 2 Zakladu Chorob Wewn. I. D. i S. K. L.; kierownik:
prof. dr W. Harwig i z Zakladu Anat.-Patol. Instytutu Gruzlicy; kierownik:
prof. dr. A. Chodkowska. Adres: Warszawa, ul. Wilenska 29 m 2.'
          (DUCTUS, ARTERIOSUS, PATENT, differential diagnosis,
                communication between aorta & pulm. artery, in adult (Pol))
       (CARDIOVASCULAR DEFECTS, CONGENITAL, differential diagnosis,
                communication between aorta & pulm. artery, from patent
                ductus arteriosus, in adult (Pol))

MASSAISKI, Wandalin; ODRZYWOISKA, Anna; MIGDAISKA, Barbara; DABROWSKA, Halina

Effect of aspartic acid and glutamic acid hydrazides on Myoobacterium tuberculosis. I. Effect of aspartic acid hydrazide on Myobacterium tuberculosis cultures. Gruzlica 26 no.11:919-928 Nov 58.

1. Z Zakladn Chorob Wewnetrznych I.D. i S.K. L. Dyrektor: prof. dr W. Hartwig z Pracowni Biochemii Pratka Instytutu Gruzlicy Kierownik: prof. dr G. Bagdasarian i z Zakladu Syntezy Lekow Instytutu Gruzlicy Kierownik: prof. dr T. Urbanski Dyrektor: prof. dr J. Misiewicz. Adres: Warszawa, ul. Plocka 26.
        (ASPARTIC ACID, rel. cpds.
            aspartic acid hydrazide, eff. on M. tuberc. (Pol))
        (HYDRAZINE, rel. cpds.
            same)
        (MYCOBACTERIUM TUBERCULOSIS, eff. of drugs on,
            aspartic acid hydrazine (Pol))

MIGDALSKA, Barbara; MASSALSKI, Mandalin

Pyruvic acid in blood. I. Blood pyruvic acid levels following ingestion
of glucose in persons with normal carbohydrate metabolism & in diabetic
patients. Polskie tygod. lek. 14 no.4:145-149 26 Jan 59.

1. Z Pracowni Biochemii Klinicznej Zakladu Biochemi Instytut Gruzlicy;
dyrektor Prof. dr med. Janina Misiewicz i z Zakladu Chorob Wewnetrznych
Instytutu Doskonalenia i Specjalizacji Kadr Lekarskich; dyrektor: prof.
dr med. Walenty Hartwig. Warszawa, ul. Plocka 26.
          (PIRUVATES, in blood
                    pyruvic acid in normal & diabetes mellitus patients
                    following glucose ingestion (Pol))
          (DIABETES MELLITUS, blood in
                    pyruvic acid levels following ingestion of glucose (Pol))
          (BLOOD SUGAR, in various dis.
                    diabetes mellitus following ingestion of glucose (Pol))

MASSALSKI, Wandalin; MIGDALSKA, Barbara; ODRZYWOLSKA, Anna; DABROWSKA,
        Haline; SZYMANSKA, Danuta

Effect of hydrazide of aspartic and glutamic acids on tubercle
bacilli. II. Effect of aspartic acid hydrazide on tubercle bacilli
in vitro and in vivo. Gruzlica 27 no.5:375-381 My '59.

1. Z Zakladu Chorob Wewnetrznych S.D.L. A.M. Dyrektor: prof.dr
W. Hartwig i z Pracowni Biochemii Pratka, Zakladu Syntezy Lekow i
Zakladu Anatomii Patologicznej Instytutu Gruzlicy. Dyrektor: prof.
dr J. Misiewicz [deceased].
        (MYCOBACTERIUM TUBERCULOSIS pharmacol.)
        (ASPARTIC ACID rel.cpds.)
        (HYDRAZIMES pharmacol.)

MASSALSKI, ·Wandalin

Albuminuria and anuria in experimental nephrosis. Pat.polska 11
no.2:97-112 '60.

1. Z I Zakladu Chorob Wewnetrznych Studium Doskonalenia Lekarzy
Akademii Medycznej Kierownik: Prof. dr med. W.Hartwig z Zakladu
Anatomii Patologicznej Instytutu Gruzlicy Kierownik: Prof. dr
med. S.Chodkowska
         (NEPHROSIS exper)
         (ALBUMINURIA exper)
         (ANURIA exper)

MASSALSKI,Wandalin; MIGDALSKA, Barbara

Effect of hyposterol on the excretion of 17-keto- and 17-
hydroxycorticoids in urine. Polskie arch.med.wewn. 30 no.6:
832-834 '60.

1. Z Zakladu Chorob Wewnetrznych Stud. Dosk. Lek. przy A.M.
w Warszawie oraz z Oddzialow Chorob Wewnetrznych Kierownik: prof.
dr med. W.Hartwig i z Pracowni Analitycznej Instytutu Gruzlicy
Dyrektor: prof. dr med. W.Jaroszewicz
            (PHENYLBUTYRATES pharmacol)
            (ADRENAL CORTEX HORMONES urine)
            (17-KETOSTEROIDS urine)

MASSALSKI, Wandalin; MIGDALSKA, Barbara

Behavior of urinary 17-keto- and 17-hydroxycorticoids under the
influence of hyposterol. Polski tygod. lek. 16 no.23:861-864
5 Je '61.

1. Z I Kliniki Chorob Wewnetrznych Studium Doskonalenia Lekarzy
A. M. oraz Oddzialu Chorob Wewnetrznych Instytutu Gruzlicy w
Warszawie; kierownik: prof. dr med. Walenty Hartwig i Pracowni
Analitycznej Instytutu Gruzlicy; kierownik: dr Aniela Wolanska.

(PHENYLBUTYRATES pharmacol)
(ADRENAL CORTEX HORMONES urine)

MASSALSKI, Wandalin; MIGDALSKA, Barbara; ODRZYWOLSKA, Anna; SZYMANSKA, Danuta;
URBANSKA-DABROWSKA, Halina

Effect of hydrazides of aspartic and glutamic acids on tubercle bacilli.
III. Effect of aspartic acid hydrazide on the course of experimental
tuberculosis in guinea pigs and its comparison with the effect of
isonicotinic acid hydrazide. Gruzlica 29 no.2:121-124 F '61.

(ASPARTIC ACID rel cpds)   (ISONIAZID pharmacol)
(TUBERCULOSIS exper)

HARTWIG, Walenty; CHODKOWSKA, Stefania; MASSALSKI, Wandalin; JEZIERSKI,
    Kazimierz; WOLANSKA, Aniela

Hashimoto's struma with dysproteinemia and antithyroid precipitins.
Polskie arch. med. wewn. 31 no.7:1917-1923 '61.

1. Z I Katedry Chor. wewn. Studium Dosk. Lek. AM w Warszawie Kierownik:
prof. dr med. W. Hartwig Z Zakladu Anatomii Patologicznej I. G. Kierownik:
prof. dr med. S. Chodkowska Z Oddzialu Chirurgicznego I. G. Kierownik:
prof. dr med. L. Manteuffel i z Pracowni Analitycznej I. G. Kierownik:
dr med. A. Wolanska.

    (THYROIDITIS blood)   (BLOOD PROTEINS)

HARTWIG, Walenty; MASSALSKI, Wandalin

Therapeutic management of bilateral hypertrophy of the adrenal cortex (a frequent form of Cushing's disease). Pol. tyg. lek. 18 no.52:1969-1973 23 D '63.

1. Z I Katedry Chorob Wewnetrznych Studium Doskonalenia Lekarzy w Warszawie (kierownik: prof. dr med. W. Hartwig).

MASSALSKI, Wandalin; MLODZKI, Miroslaw; BRZOSKO, Witold; NOWOSLAWSKI, Adam

Immunofluorescence reactions during the administration of I-131. Pol. tyg. lek. 19 no.42:1596-1599 19 O '64

1. Z I Kliniki Chorob Wewnetrznych Studium Doskonalenia Lekarzy w Warszawie (kierownik: prof. dr. med. W. Hartwig)oraz z Zakladu Anatomii Patologicznej Akademii Medycznej w Warszawie (p.o. kierownika: doc. dr. med. R.Stanczykowa).

REZNIKOV, D.I., inzh.; MASSAL'SKIY, E.A., inzh.

Building precast conrete reservoirs. Prom. stroi. 41 no.1:
38-40 Ja '64.
(MIRA 17:6.

Massal'skiy, V. I.

SOV/56-36-3-16/71

21(7)
AUTHORS: Abrosimov, A. T., Dmitriyev, V. A., Kulikov, G. V.,
          Massal'skiy, Ye. I., Solov'yev, V. I., Khristiansen, G. B.

TITLE: The Nuclear-Active Component of High Energy in Extensive
          Atmospheric Showers at Sea Level (Yaderno-aktivnaya komponenta
          vysokoy energii v shirokikh atmosfernykh livnyakh na urovne
          morya)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,
             Vol 36, Nr 3, pp 751-761 (USSR)

ABSTRACT: In the present paper the authors report about statistical
          investigations of nuclear avalanches in extensive air showers
          at sea level by means of a sensitive detector. Measurements
          were carried out in 1957 by means of a device for combined
          investigations of extensive air showers which is one in opera-
          tion at the MGU. It has 4 cylindrical pulse ionization chambers
          under a lead-graphite filter and 720 Geiger-Mueller (Geyger-
          Myuller) counters in hodoscope connection for the recording
          and energy determination of nuclear particles. The counters
          were connected in coincidence groups (total area 1320 cm²),
          so that sixfold coinciding pulses were recorded. Figure 1
          gives a rough outline of the device including its dimensions.

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SOV/56-36-3-16/71
The Nuclear-Active Component of High Energy in Extensive Atmospheric Showers
at Sea Level

The recorded and investigated showers are divided into 4
groups according to the particle number N:

1) $1 \cdot 10^4 < N_1 < 3 \cdot 10^4$,   2) $3 \cdot 10^4 < N_2 < 1 \cdot 10^5$,
3) $1 \cdot 10^5 < N_3 < 3 \cdot 10^5$,   4) $3 \cdot 10^5 < N_4 < 2 \cdot 10^6$.

For these 4 groups table 1 gives the number of particles with
energies greater than one given, and also the maximum energy
of the nuclear-active particle of individual groups. For the
latter the following applies:

group	N	E_{nucl}^{max}	$\bar{r}$	(R = radius of the investigated shower range)
1	3N	$4.7 \cdot 10^{12}$ ev	1.8 ± 0.5	
2	4N	10^{13} ev	1.0 ± 0.2	
3	5N	$1.8 \cdot 10^{13}$ ev	0.9 ± 0.3	
4	6N	6.10^{13} ev	0.7 ± 0.3	

Figure 2 shows the course of the spectrum for the two extreme
groups. Further investigations deal with the spatial distri-
bution of the energy flux of the nuclear-active component;

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The Nuclear-Active Component of High Energy in Extensive Atmospheric Showers
at Sea Level

figures show in diagram (for 4 shower groups with particle
energies of $1.10^{11} - 3.10^{11}$ ev, $3.10^{11} - 1.10^{12}$, $> 1.10^{12}$
and $E > 8.10^{11}$ ev. Figure 4 shows the course of energy flux
density for $N_{1,2,3}$ and N_4 and figure 5 shows the distribu-
tion of the energy flux N_4 in shower with $N = 2.10^5$. It was
found that the energy of the nuclear-active component in some
showers with equal N may differ considerably. Results are dis-
cussed, and in an appendix the energy distribution with respect
to shower particle is investigated. The authors finally
thank S. N. Vernov, G. T. Zatsepin for their help, valuable
remarks, and discussions. They further thank Z. S. Pogosyants,
T. I. Fesenko, and F. M. Sokolov for taking part in measure-
ments. There are 5 figures, 3 tables, and 17 references, 15
of which are Soviet.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo universiteta
             (Institute for Nuclear Physics of Moscow State University)

SUBMITTED: September 15, 1958

Card 3/3

21(8)
AUTHORS:

SOV/56-36-4-4/70

Dmitriyev, V. A., Kulikov, G. V., Massal'skiy, Ye. I.,
Khristiansen, G. B.

TITLE:

The Spatial Distribution of the Energy Flux of the Electron-
Photon Component of Extensive Atmospheric Showers (Prostranst-
vennoye raspredeleniye potoka energii elektronno-fotonnoy kom-
ponenty shirokikh atmosfernykh livney)

PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36,
Nr 4, pp 992-1000 (USSR)

ABSTRACT:

In the present paper the authors report on the results obtained
by measurements carried out between June 1957 and February 1958
at sea level by means of a device for the complex investi-
gation of extensive air showers. The device is at present in
operation at MGU (Moscow State University). It is described in
detail and is illustrated by figure 1 in form of a schematical
drawing. The ionization chambers used had a diameter of 25 cm
and a length of 1 m, the total area covered by them amounting
to 3 m^2; they were filled with very pure argon, pressure 3 atm,
and were enclosed on all sides by filters. The counters, each

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of 330, 100, and 18 cm^2, were arranged in groups of 24 and were

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The Spatial Distribution of the Energy Flux of the Electron-Photon Component
of Extensive Atmospheric Showers

arranged in such a manner that they operated simultaneously within a range of distances of 1 - 50 m from the shower axis. A total of 2000 Geiger-Mueller counters in hodoscope connection (GK-7) was used. Showers with particle numbers of from 1.10^4 to 2.10^6 were investigated. The showers were divided into groups with the average particle numbers $< 1.10^4$, 2.10^4, $5.6.10^4$, 2.10^5, $5.7.10^5$ and $> 10^6$ for the 6 N_i-groups. For energy flux density it holds that $\varrho_E = n(t) \int \beta dt$ and for $t = 8$

$$\varrho_E = \int n(t)\beta dt + \int \beta n(t=8)\exp(- \omega_t t)dt$$ (Figure 2 shows the course of these curves for the N_4-group). $n(t)$ denotes the particle number in dependence on the penetration depth t, and β denotes the average energy loss per t-unit. Figure 3 in semilogarithmic scale shows the course of energy flux density for the groups $N_1 - N_5$. Further diagrams show the dependence of electron-photon component energy on the distance from the shower axis r

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The Spatial Distribution of the Energy Flux of the Electron-Photon Component
of Extensive Atmospheric Showers

and on N. Further data concern investigations of the meson
component. For $r < 6$ m it holds that

$$N_\mu = 10^{-2} \int \frac{kN}{r} \, 2\pi r \, dr = 7.3 \cdot 10^{-4} N, \ (k = 2 \cdot 10^{-3}) \Delta E_\mu \ (< 6m) \sim$$

$0.005 \ E_{el-ph} \ (< 6m)$ for the share of the muon component in
energy flux. For the electron-photon component the following
holds for n: n = -1.5 ± 0.2 at $1m < r < 8m$ and

n = -2.0 ± 0.3 at $10m < r < 50m$.

The spatial energy distribution function of this component does
not depend on N for showers with the total particle number of

$N = 10^4 - 10^6$. The spatial distribution of the energy fluxes
in the central part of the shower agrees with the cascade
theory calculations in the case of a cascade parameter s= 1.2
being used. It was further found that with an increase of
distance from the shower axis the energy flux of the electron-
photon component decreases more slowly than the energy flux

Card 3/4   of the nuclear-active component. In a circle with the radius

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The Spatial Distribution of the Energy Flux of the Electron-Photon Component
of Extensive Atmospheric Showers

of 50 m about 75% of the total energy of the electron-photon
component of the shower is contained. The authors finally
thank S. N. Vernov and G. T. Zavsepin for their great help,
I. P. Ivanenko for discussions, and V. I. Artemkin, L. A. Di-
karev, V. N. Sokolov, K. I. Solov'yev, and D. S. Stel'makh
for assisting in measurements and in the evaluation of data.
There are 5 figures and 13 references, 9 of which are Soviet.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo uni-
                versiteta (Institute for Nuclear Physics of Moscow State
                University)

SUBMITTED: September 15, 1958

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MASSALSKIY, YE. I., TRETYAKOVA, S. A., SHESTOPEROV, V. YA., BABAYAN, K. F.,

BUYA, Z. A., Grigorov, N. L., Bayadjan, N. Y., Babezki, V. S., Loskeviez, J.,

Dles, A., Murzin, V. S.

"Mountain-Altitude Studies of the Interacti n of High-Energy
Particles with Atomic Nuclei."

report submitted for the Intl. Conf. on Cosmic Rays and Earth Storm (IUPAP)
Kyoto, Japan 4-15 Sept. 1961.

25181
S/056/61/040/006/002/031
B102/B214

3.24/0

AUTHORS: Babetski, S. Ya., Buya, Z. A., Grigorov, N. L., Loskevich,
             Ye. S., Massal'ski Ye. I., Oles', A. A., Shestoperov. V. Ya.

TITLE: Investigation of large ionization bursts caused by cosmic ray
             particles at sea level

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 40,
             no. 6, 1961, 1551 - 1561

TEXT: The authors investigated particle interactions for energies of 10^{12} -
10^{13} ev using photoemulsions. The reports on the measurements are presented
in this paper. The experimental arrangement consisted of 128 ionization
chambers (total area 10 m^2), which together with a combined lead graphite
filter formed a so-called ionization calorimeter which also made the deter-
mination of shower coordinates possible. This apparatus was set up on Mount
Aragats at a height of 3200 m (a simpler variety of this device was used in
Moscow earlier, 50 m above sea level). Fig. 1 shows the arrangement of the
layers and cylindrical ionization chambers (I-IV) above and below the
graphite layer (density 60 g/cm^2). The apparatus was placed in a special
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Investigation of . . .

building and covered on the top by light materials only (2 g/cm^2). All the amplifiers were calibrated by radiotechnical means twice a day. The amplification factor was found in general not to vary more than 2 - 3 % in the course of a day. During the first half period of the measurements in series I of chambers the frequency of the bursts of a size of J_1 = 1200 relativistic particles was $(1.27 \pm 0.03) \cdot 10^{-1}/\text{hr} \cdot \text{m}^2$; in the second half period it was $(1.25 \pm 0.03) \cdot 10^{-1}/\text{hr} \cdot \text{m}^2$. Measurements carried out for 2640 hours with the chambers placed below the graphite layer showed that the electron and photon showers recorded were produced inside the apparatus. The intensity ratio for the two series for a shower with particles numbering $(1.2 - 2.4) \cdot 10^3$ was $\overline{(J_1/J_2)}$ = 1.5 $\pm$ 0.1; for showers with number of particles $>1.2 \cdot 10^4$ this ratio was 3.4 $\pm$ 0.8. These showers could have been produced in the apparatus by the interaction of the high energy particles of nuclear kind in the graphite, or by the electromagnetic interaction of high energy muons in the filter. The spectrum of the ionization bursts was determined from the total ionization recorded in all the chambers (for the bursts considered) separately for the first and the second series. If the observed distribu-

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tion is represented in the form of an exponential law $N \, (\geqslant J) = AJ^{-\gamma}$, for the first series is 1.71 ± 0.04 and for the second 2.00 ± 0.04. These results agree well with those of other authors. Part of the showers were distinguished by a strong nonmonotonous ionization distribution in the series I and II (ionization in the individual chambers, very weak or no ionization in the neighboring chambers). These were designated as "structural" bursts. Numerical data on these are given in Table 1. The average distance 1 between the chambers, recording maximum ionization, were also determined for this kind of bursts. The results are given in Table 2. The spectrum of these

bursts may be represented by $N \, (\geqslant J) = BJ^{-\gamma}$, where $\gamma = 1.96 \pm 0.03$. The results are discussed in the following, and an attempt has been made to determine the course of the bursts in altitude by theoretical considerations. This is done under special assumptions about the properties of the participating pions and the spectrum of the primary particles. The nature of large ionization bursts is also discussed. The authors thank Diploma Student V. Trush for collaboration. Ye. A. Murzina, S. I. Nikol'skiy, and V. I. Yakovlev are mentioned. There are 4 figures, 2 tabels and 12 references: 11 Soviet--bloc and 1 non-Soviet-bloc.
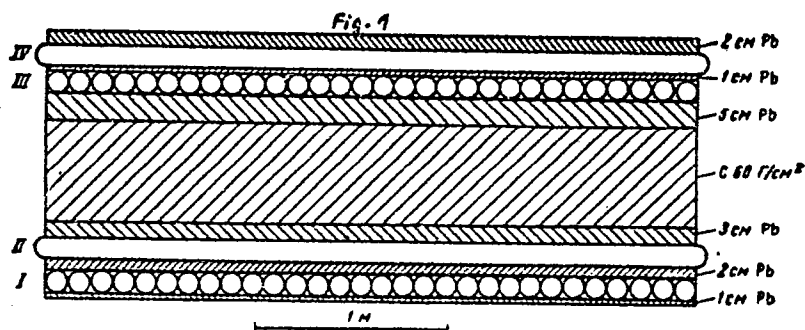
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25181
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B102/B214

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo uni-
versiteta (Institute of Nuclear Physics of Moscow State Uni-
versity)

SUBMITTED: December 20, 1960

Fig. 1

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3,2410 also 2412.

26407
S/056/61/041/001/002/021
B102/B212

AUTHORS: Babetski, Ya. S., Buya, Z. A., Grigorov, N. L., Loskevich, Ya. S., Massal'skiy Ye. I., Oles', A. A., Shestoperov, V. Ya., Fisher, S.

TITLE: Nuclear-active particles in atmospheric showers

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 1 (7), 1961, 13 - 21

TEXT: The aim of the present paper has been to contribute to the clarification of the characteristics of elementary processes underlying the formation of an extensive air shower and also of the role played by the nuclear-active component in shower formation. A number of shower parameters have been determined (the energy E_{e-ph} of the electron-photon component, the energy transferred by π^0 mesons, and the ionizations I in the chamber rows) by employing an arrangement which has been described earlier by the authors (Ref. 4: ZhETF, 40, 1551, 1961). It consists of 128 ionization chambers (active area, 10 m^2). [Abstracter's note: In order to follow the

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Nuclear-active particles in...

statements, a knowledge of Ref. 4 is required] The measurements were made
at sea level for both extensive and "young" atmospheric showers. Of all
extensive atmospheric showers recorded, those with $J_{3,4} \geqslant 1.2 \cdot 10^4$ relativistic
particles (i. e., $E_{e-ph} \geqslant 2 \cdot 10^{12}$ ev) have been selected. 284 such showers
had been found after 1842 hours of measuring. (The ionization chambers were
arranged in four rows; $E_{\pi 0}/E_{e-ph} = J_{1,2}/J_{3,4}$ could be set in good
approximation). A determination of the position of the axes of these
extensive atmospheric showers showed that in about half of all cases the
shower axis hit the instrument and in all other cases the axis was found
nearby. It can thus be assumed that the mean value $\overline{E_{\pi 0}/E_{e-ph}}$ measured
refers to the central region of the shower. The selected showers with
$J_{3,4} \geq 1.2 \cdot 10^4$ had a number of particles amounting to $\approx 10^5$, and $\overline{(J_{1,2}/J_{3,4}}$
- 0.130 ± 0.047 was obtained for them. For showers whose axes did hit the
measuring arrangement this ratio was equal to 0.128 ± 0.036. Assuming
that the ionization by nuclear-active particles was not a function of the
location of the chamber in the arrangement, then it follows that the

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electron-photon component in row I increases the ionization by $30\pm7.5\%$. From this it follows that $(E_{\pi}o/E_{e-ph}) = 0.091 \pm 0.031$; if the angular distribution in an extensive atmospheric shower is taken into account, one obtains 0.097 ± 0.036. Table 2 shows the ionization ratios for various shower groups. Special investigations which have been made for "young" atmospheric showers (1900 hours, 52 "young" atmospheric showers with $J_{3,4} > 1.2 \cdot 10^4$ relativistic particles) yielded the following results: The intensity of these showers "young" atmospheric showers was equal to $0.95 \pm 0.13) \cdot 10^{-10}$ cm^{-2} sec^{-1}, and the energy of the electron-photon component was not less than 2.10^{12} ev. The ionization in the third chamber row was always $1.5 - 2$ times higher than that in the fourth row. The intensity of individual showers $(J_2 \geq 1.2 \cdot 10^4)$ measured in the second row was equal to 2.10^{-11} cm^{-2} sec^{-1}. The J_3 or E_{e-ph} distribution of the "young" showers can be described by $N(\geq J_3) = AJ_3^{-\gamma}$, where $\gamma = 1.5 \pm 0.4$. Some cases have been found with $E_{e-ph} \geq 10^{13}$ ev. These "young" showers

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proved to be starts of extensive atmospheric showers with $N \sim 10^4$ at most. For these 52 "young" atmospheric showers a value of $(J_{1.2}/J_3) = 0.11 \pm 0.03$ has been found, i. e., it was nearly equal to that of extensive atmospheric with $J_3 \geq 1.2 \cdot 10^4$. An estimation of the ratio of the energy of nuclear-active particles to the energy of the electron-photon component furnishes a value that is 2.5 - 2 times smaller than that found earlier (by assuming an inelasticity coefficient $K \approx 0.3$; cf. ZhETF, 36. 75., 1959). Therefore, it has to be assumed that $K \approx 0.75 - 0.6$. Furthermore, it has been found that near the axes of extensive atmospheric showers the energy of nuclear-active particles is less than 50 % of the energy of the electron-component $(E_{n.a.}/E_{e-ph} = 0.40 \pm 0.14)$, and that in about 30 % of all "young" atmospheric showers the nuclear-active component is practically absent. There are 5 figures, 2 tables, and 6 Soviet-bloc references.

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo
universiteta (Institute of Nuclear Physics of Moscow State
University)

Card 4/5

MASSALSKIY, YE.I.

3.2410 (2205, 1705, 1805)

37530
S/048/62/026/005/002/022
B102/B104

AUTHORS: Babayan, Kh. P., Babetski, Ya. S., Boyadzhyan, N. G.,
            Buya, Z. A., Grigorov, N. L., Loukovich, Ye. S.,
            Mamidzhanyan, E. A., Massal'skiy, Ye. I., Oles', A. A.,
            Tret'yakova, Ch. A., and Shestoperov, V. Ya.

TITLE: Investigation of the interaction of high-energy particles
            with atomic nuclei on mountains

TEXT: Ionization bursts caused by the electron-photon component of a
shower of cosmic-ray particles were studied with an array of ionization
chambers (Fig. 1) at the mountain station (3200 m) of the Akademiya nauk
Armyanskoy SSR (Academy of Sciences Armyanskaya SSR). The array consisted
of six rows of ionization chambers separated by layers of lead and
graphite, and covered an area of 10 m^2. Owing to this large area, heavy
bursts with a total energy of locally generated π^0 mesons amounting to
$\sim 10^{13}$ ev could be photographed. The data obtained were analyzed for

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B102/B104

ionization bursts in the filter of the arrangement, for the altitude
dependence of the burst frequency, and for the burst spectrum and its
dependence on the size of the arrangement; the mechanism of local n^0
generation by single nuclear-active particles was investigated. The bursts
observed were grouped according to their intensity I, i.e., according to
the number of relativistic particles involved; for each group, the numbers
of ionization and "structuralized" bursts were determined for rows I-IV.
The spectrum of ionization bursts can be described by $N(>I) = AI^{-\gamma}$ for

all chambers. The index of the integral spectrum for $2 \cdot 10^3 \leq I \leq 2 \cdot 10^5$

equals 1.37 ± 0.02. With an area of $\sim 0.6 \, m^2$ it was found that $\sim 20\%$ of the

bursts were "structuralized" for $1 \cdot 10^3 \leq I \leq 5 \cdot 10^3$. At $I > 1 \cdot 10^4$ and $10 \, m^2$
50% of the bursts (at sea level) and 75% (on the mountains) have a struc-
ture. An analysis of the course of the bursts with the altitude has shown
that: (1) the integral spectrum of muon-induced bursts with $3 \cdot 10^3 - 3 \cdot 10^4$
particles has an exponent of $\gamma = 2.22 \pm 0.14$; (2) for a burst of equal
intensity, induced by a single nuclear-active particle, $\gamma = 1.98 \pm 0.09$;
(3) at 3200 m, the muon contribution to single heavy bursts is small (15%
of all bursts with $\sim 10^3$ particles, and $\sim 4\%$ of those with $\sim 2 \cdot 10^4$ particles;
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